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PUBLIC NOTICE

The Montana Department of Environmental Quality (DEQ) intends to reissue a hazardous waste operating permit to the Burlington Northern & Santa Fe Railway Company for operation of a Corrective Action Management Unit (CAMU), post-closure care of a Surface Impoundment (SI), and facility-wide corrective action at the Paradise Former Tie Treating Plant, Montana. The draft permit is being issued under Title 75, Chapter 10, Part 4, of the Montana Hazardous Waste Act and the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984.

An environmental assessment (EA) has been prepared for this permit reissuance in accordance with the Montana Environmental Policy Act. The EA documents all reasonable alternatives to DEQ's permit action and outlines the potential impacts to the human environment resulting from DEQ's permitting action ad the reasonable alternatives.

This notice is to inform the public of the draft permit, the associated EA, and the Statement of Basis (SOB) and to seek their participation in the decision-making process. During the 45-day comment period, the public may submit written comments to DEQ. The comment period will extend from May 2, 2001 through June 15, 2001. The draft permit is available for examination at the Plains Public Library, 108 West Railroad, Plains, Montana, phone 406/826-3101, and at the Air & Waste Management Bureau, Metcalf Building, 1520 E. 6th Avenue, Helena, Montana, phone 406/444-3490. A fact sheet, EA, and Statement of Basis describing the facility and proposed permit changes will be available for review at the above locations or on DEQ's internet website at: www.deq.state.mt.us.

DEQ will hold a public meeting and hearing on the draft permit on May 23, 2001 from 6:30 p.m. to 9:00 p.m. in the Methodist Clubhouse in Paradise, Montana. The meeting/hearing will consist of an information question and answer session from 6:30 p.m. to 7:30 p.m.; formal comments on the draft permit will be taken from 7:30 p.m. to 9:00 p.m.

All written comments on the draft permit should be addressed to Ann Kron, DEQ, Permitting and Compliance Division, Air & Waste Management Bureau, P.O. Box 200901, Helena, MT 59620-0901, phone 406/444-5824. Interested persons may also call or write for additional information.

Based on the comments received, DEQ will make a final decision to issue, deny, or change the draft permit. Notice will then be given to the applicant and each person who submitted written comments or requested a notice of the decision. The final permit decision shall become effective thirty (30) days after the service of notice of the decision, unless a later date is specified in the notice. If no comments are received requesting a change in this draft permit, the final permit shall become effective immediately upon issuance.

Dated Tuesday, April 24, 2001

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HELENA, MONTANA 59620

FACT SHEET

FOR REISSUANCE OF A HAZARDOUS WASTE OPERATING PERMIT
(Permit Number MTHWP-88-03)

THE BURLIGTON NORTHERN & SANTA FE RAILWAY COMPANY
PARADISE TIE TREATING PLANT
PARADISE, MONTANA
EPA ID NO. MTD 000716787

The Montana Department of Environmental Quality (DEQ) is proposing to reissue a hazardous waste operating permit to Burlington Northern & Santa Fe (BNSF) Railway at its former Paradise Tie Treating Plant. The draft permit contains requirements for operation of a corrective action management unit (CAMU), post-closure care of a surface impoundment (SI) and waste pile unit (WPU), facility-wide corrective action, and incorporation of corrective action remedies. The requirements in the draft permit regarding management of a CAMU are being issued jointly by DEQ and the US Environmental Protection Agency (EPA).

This draft hazardous waste operating permit is a reissuance of MTHWP-88-03 issued by DEQ and the corrective action permit issued by EPA in 1989. MTHWP-01-02 is issued under Title 75, Chapter 10, Part 4 of the Montana Hazardous Waste Act (MHWA), the federal Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 and as amended by the Hazardous and Solid Waste amendments of 1984 (42 US Code §6901 et seq., commonly known as RCRA).

This fact sheet was prepared in accordance with the requirements of 40 Code of Federal Regulations (CFR) 124.8, as incorporated by reference in the Administrative Rules of Montana (ARM) 17.53.1201.

INTRODUCTION

Facility Background:
Creosote wood treating operations were conducted at the Paradise Tie Treating Plant by Burlington Northern Railroad (BNSF) from 1908 until 1982. During the operation of the facility, an abandoned channel of the Clark Fork River was utilized as a surface impoundment (SI) for the disposal of creosote wastewaters. Creosote wastewaters are a listed hazardous waste (K001), and therefore, the disposal of creosote wastewaters into the SI required BNSF to obtain a hazardous waste operating permit.

Practices during the operation of the plant resulted in contamination in both the SI and the tie-treating plant area. Proper closure of the SI directed BNSF to find a viable way to treat the creosote contaminated soils and sludges encountered in the SI. It was determined that on-site land treatment was a possible option for treating the creosote contaminated soil and sludge encountered at the site.

Land treatment involves the incorporation of waste into the upper 12 inches of the soil. Microbes and sunlight then degrade, transform, or immobilize hazardous constituents present in the waste. Maintenance of proper soil pH, soil nutrients, careful management of waste application rate, and control of surface water run-off are all key to the operation of a land treatment unit.

In July 1985 a land treatment demonstration plot was constructed at the site to determine if a full-scale land treatment unit (LTU) could treat the creosote-contaminated soils and sludges. The land treatment demonstration study proved that the soil and sludge wastes could be degraded, transformed, and immobilized within a LTU.

A waste pile unit was constructed in 1985 on the SI. Creosote contaminated sludge and soils excavated from the surface impoundment as well as remediation wastes from a Superfund emergency removal at the BNSF Somers tie treating facility were then stored on the waste pile unit until the LTU could be constructed.

The LTU was constructed in 1989. Four waste applications were made during the operating life of the LTU. The first application was in 1989, when the entire 20,000 cubic yard waste pile was excavated and placed on the LTU. In 1990, 4,500 cubic yards of soil excavated from the former drip track area was applied to the LTU. In 1992, 10 cubic yards of soil from the RCRA Facilities Investigation (RFI) activities was applied. In 1994, 3 cubic yards of soil generated from the RFI Phase II soil borings were applied to the LTU.

Hazardous Waste Operating Permit Background:

The Resource Conservation and Recovery Act (RCRA) is the federal law under which regulations concerning the management, treatment, storage and disposal of hazardous waste are implemented. The Montana Hazardous Waste Act (MHWA) is the State equivalent of RCRA. MHWA regulations require facilities with land treatment units to obtain a hazardous waste operating permit.

Hazardous waste operating permits are issued for a period of 10 years. At the end of this period, the Permittee may apply for renewal of the permit. The State of Montana issued the current operation permit for the BNSF Paradise Site on December 30, 1988. BNSF submitted a draft application for permit renewal in August 1998, and the final application was submitted in July 1999. At the time of finalization of the permit reissuance, this draft permit will replace the current permit.

Corrective Action Permit Background:

In 1984, Congress amended RCRA. The amended law, titled the Hazardous and Solid Waste Amendments of 1984 (HSWA), includes a requirement that owners and operators of hazardous waste facilities remediate releases of hazardous wastes or hazardous constituents from solid waste management units (SWMUs) and areas of concern (AOCs). A SWMU is any unit that was used at any time to manage waste, regardless of whether the unit was intended for that purpose. An AOC is any area at a facility having a probable release of a hazardous waste or hazardous constituent that may or may not be from a SWMU. The HSWA corrective action requirements are established in Section 3004(u) of RCRA and are codified in federal regulations at 40 CFR Section 264.101, as incorporated by reference in ARM 17.53.801.

Through HSWA, Congress required permits issued to hazardous waste facilities contain corrective action requirements for SWMUs/AOCs. BNSF managed wastes in a number of SWMUs and AOCs at the site. Some of these units contain creosote-contaminated soils or contaminated groundwater that require remediation. In 1989, EPA issued a HSWA (Hazardous and Solid Waste Amendments of 1984) Permit for the Paradise site which required BNSF to investigate all facility SWMUs/AOCs and develop a corrective measures study for the SWMUs/AOCs which are contaminated above acceptable levels.

On December 26, 2000, MDEQ was authorized by EPA to implement the requirements of HSWA. The draft hazardous waste operating permit incorporates corrective action requirements and in its final version will replace EPA's 1989 corrective action permit.

Corrective Action Process: The corrective action process generally comprises six activities. These activities are not always undertaken as a linear progression towards final facility cleanup, but can be implemented flexibly to most effectively meet site-specific corrective action needs. These six activities are:

- RCRA Facility Assessment (RFA): Often the first activity in the corrective action process is the RFA. The objective of the RFA is to identify potential and actual releases from SWMUs/AOCs and make preliminary determinations about releases, the need for corrective action, and interim measures. The EPA completed the RFA for the BNSF Paradise site in 1989.
- Interim/Stabilization Measures: Interim/stabilization measures are short-term actions taken to respond to immediate threats to human health or prevent damage or contaminant migration to the environment. Interim or stabilization measures may be taken at any time in the corrective action process.
- RCRA Facility Investigation (RFI): The RFI takes place when a release has been identified

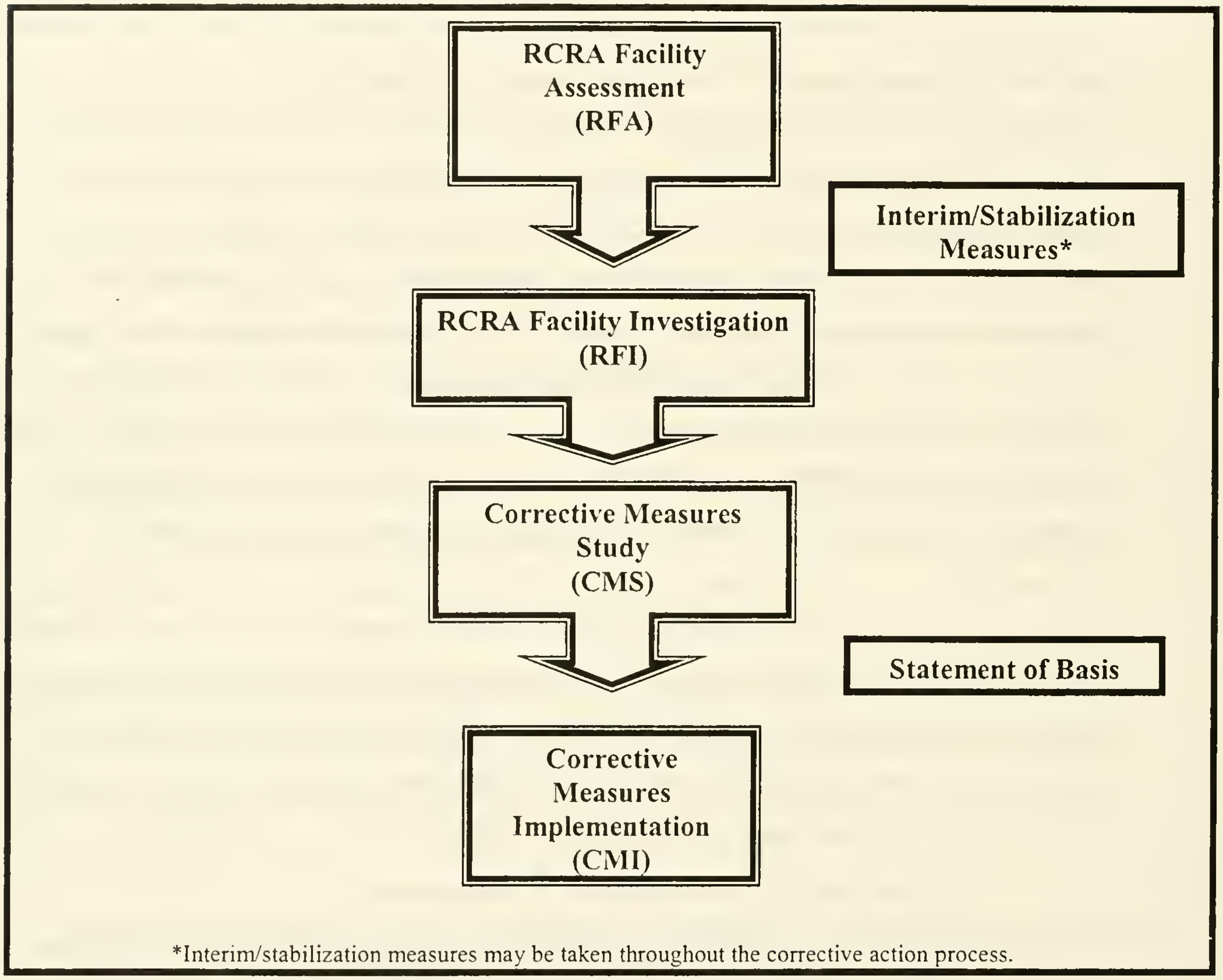
and further investigation is necessary. The purpose of the RFI is to gather enough data to fully characterize the nature, extent, and rate of migration of contaminants to determine the appropriate response action. For the BNSF Paradise site, a phase I RFI report was completed in June 1994 and a phase II RFI report was completed in July 1996.

- Corrective Measures Study (CMS): After the RFI is completed and the regulatory agency determines that cleanup is necessary, the regulatory agency may request the owner and operator to conduct a CMS. The purpose of the CMS is to identify and evaluate cleanup alternatives, called corrective measures, for releases at the facility. The recommended measures are reviewed by regulatory agency. The regulatory agency then selects the best remedy, given the site-specific considerations. When a remedy is selected, the facility's permit is modified to include the remedy and is subject to public review and comment. The selected remedy for BNSF Paradise will be included in the current permit reissuance. The CMS was completed in July, 1999. DEQ and EPA conditionally approved a remedy in August, 2000.
- Statement of Basis: This document describes the basis for remedy selection and provides the public with an opportunity to comment on the remedy. When selecting a remedy the short- and long-term reliability and effectiveness; reduction of toxicity, mobility or volume of hazardous constituents; implementability; and costs are taken into consideration. In addition, proposed remedies must satisfy the following criteria:
    - Be protective of human health and the environment;
    - Control the sources of releases thereby reducing or eliminating, to the maximum extent practicable, further releases posing a threat to public health and the environment;
    - Attain media clean-up standards; and
    - Comply with applicable waste management standards.

  The Statement of Basis for the BNSF Paradise site can be found in Appendix A of the draft permit, and is included with this fact sheet and environmental assessment.
- Corrective Measures Implementation (CMI): Once a remedy has been selected, the facility enters the CMI phase of corrective action. During the CMI, the owner and operator of the facility implement the chosen remedy. Requirements for a CMI for the BNSF Paradise site

are included in the draft permit.

See Figure 3 for a flowchart showing the corrective action process.


RCRA Facility Assessment (RFA)
Interim/Stabilization Measures*
RCRA Facility Investigation (RFI)
Corrective Measures Study (CMS)
Statement of Basis
Corrective Measures Implementation (CMI)

*Interim/stabilization measures may be taken throughout the corrective action process.

Figure 3: Corrective Action Process.

PERMIT CONDITIONS

All conditions of the draft permit are based on requirements in Title 17, Chapter 53 of ARM for the management of hazardous waste.

The draft permit contains seven sections; each focusing on specific topics:

Module I	Standard Conditions
Module II	General Facility Conditions

Module III	Corrective Action Management Unit (CAMU) Operations
Module IV	Groundwater Monitoring
Module V	Closure/Post-Closure
Module VI	HSWA Facility-wide Corrective Action Requirements
Module VII	Waste Minimization

CAMU Operation Requirements

CAMUs are physically distinct geographic areas within a facility designated for managing remediation wastes generated by corrective action or cleanup at the facility. CAMU rules are set forth in 40 CFR 264.552, as incorporated by reference in the Administrative Rules of Montana (ARM) 17.53.801. BNSF has requested a CAMU designation for the purpose of management, treatment, and disposal of soil and groundwater that may be generated during corrective action activities at the site.

BNSF has proposed the LTU and a portion of the surface impoundment (SI) be designated a CAMU. Remediation wastes treated on the CAMU will include contaminated soils, treated and untreated groundwater, sediments, sludges, and spent granular activated carbon (GAC).

The draft permit, through permit conditions, requires BNSF properly manage and treat the waste placed on the LTU. BNSF must ensure, through waste analysis, that waste placed on the LTU is within the designated loading limits. Soil nutrients (specifically carbon, nitrogen, potassium, and phosphorous) and pH must also be kept within certain limits and the LTU must be tilled to control weeds and odor. BNSF must also minimize blowing soils and/or wastes.

Creosote is present beneath the former tie treating plant as a free phase liquid, and as a residual. A product recovery system (PRS) was installed with the objective of creosote removal from recovery wells installed in the SI and former retort area. Construction of the PRS in the SI and in the former retort area was completed in November 1996 and operations started up in October 1997. Groundwater that has gone through the treatment system and meets treatment standards will be re-infiltrated into the SI. Groundwater that does not meet treatment standards can be placed on the LTU, along with sludges and the spent GAC from the treatment process.

CAMU Monitoring Requirements

In order to guard against contamination of deeper soils or groundwater, the draft permit requires routine sampling of soils and groundwater in and around the CAMU. If contamination is found in soils below 5 feet (60 inches) or is detected in groundwater, the draft permit requires BNSF to take action to correct the problem and revise operational activities to prevent future problems.

Soils within the 'zone of incorporation' (defined as a zone 0 to 12 inches from ground surface) must be sampled for nutrient level, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), oil and grease, and metals. Sampling for nutrient level helps determine fertilizer needs; PAH and VOC analysis indicates how well the waste is being degraded. The draft permit requires specific metal and oil and grease loading limits for the ZOI, which cannot be exceeded.

Soils within the 'treatment zone' (defined as a zone between 36 to 54 inches below ground surface) and within the 'below treatment zone' (defined as a zone between 60 to 66 inches below ground surface) must be sampled for PAHs and VOCs to ensure there is not significant migration of contaminants from the ZOI.

BNSF is required to sample groundwater monitoring wells associated with the LTU portion of the CAMU semi-annually for specific conductivity, oil and grease, PAHs and VOCs. The monitoring wells associated with the SI portion of the CAMU must be sampled quarterly for total solids, specific conductivity, PAHs and VOCs.

Lysimeters, which are used to sample soil-pore liquid in the unsaturated zone, must be sampled for PAHs and VOCs after each application of waste onto the LTU.

There are also monitoring requirements for water and waste generated from the product recovery system. These requirements include analyzing solids generated from the PRS for oil and grease, VOCs, PAHs, and pH; analyzing untreated groundwater for VOCs, PAHs, and liquid waste standards; and also analyzing treated groundwater for VOCs and PAHs.

CAMU Closure and Post-Closure:

The draft permit also contains requirements for closure of the CAMU and for maintaining 'post-closure care' of the unit after closure. The unit will be closed once closure performance standards specified in the draft permit are met. Closure performance standards were determined by risk-based numbers to ensure minimal exposure to contaminants. Final closure includes establishing a vegetative cover over the entire unit. Continued soil and groundwater monitoring, inspection and general maintenance of the CAMU are all part of post-closure care requirements.

Oversight of the CAMU:

The State of Montana has not yet been authorized by EPA to implement the requirements of the CAMU; therefore, EPA and the State of Montana are issuing the portions of the draft operating permit (Module III) which addresses the CAMU requirements under joint signature. EPA will have the lead on oversight of the CAMU portion of the draft permit until the State of Montana is authorized for the implementation of the CAMU. DEQ will assume the lead oversight role on all CAMU requirements once the State is authorized for the CAMU by EPA.

Surface Impoundment and Waste Pile Unit (SI/WPU)

The SI/WPU is currently in post-closure care. Post-closure care requirements include maintaining a well-established vegetative cover and controlling wind dispersal of hazardous waste. Groundwater monitoring must also be conducted quarterly. Groundwater must be analyzed for VOCs, PAHs, pH, temperature, specific conductivity, and total suspended solids.

Corrective Action Requirements:

The standard for determining whether corrective action is needed at the SWMUs/AOCs identified at the BNSF Paradise site is protection of human health and the environment. Module VI of the draft permit will require corrective action when there is a release of hazardous waste or hazardous constituents that poses an unacceptable risk to human health and the environment. To date, SWMUs/AOCs have been identified, and a plan to address clean-up of the SWMUs has been completed. DEQ proposes to address surface soil contamination at the site by excavation and on-site treatment. The excavated areas would then be backfilled with clean fill and soil, and plants would be established on the soil cover. The excavated soil would be treated on site at the proposed CAMU. A statement of basis (SB) has been completed for the preferred soil remedy described above. The SB describes the alternative clean-up options considered, and the explanation of the remedy selected. The SB can be found in Appendix A of the draft permit and is also provided with this fact sheet.

This proposed remedy is limited to the surface soils portion of the CMS. DEQ will propose the groundwater remedy in a future modification of BNSF's permit. Any remaining work needed to address sediment contamination will also be included in a future permit modification.

PURPOSE OF THE PUBLIC COMMENT PERIOD

The public comment period allows interested citizens, DEQ, EPA, and other governmental agencies an opportunity to evaluate the ability of BNSF to comply with the requirements outlined in the draft permit. The public is given forty-five (45) days to review and comment on the draft permit before any final action is taken by DEQ and EPA. Additional information on the public comment period is found at the end of this fact sheet.

DEQ will hold a public meeting and hearing on the draft permit on May 23, 2001 from 6:30 to 9:00 p.m. in the Methodist Clubhouse in Paradise, Montana. The meeting/hearing will consist of an informational question and answer session from 6:30 to 7:30 p.m.; formal comments on the draft permit will be taken from 7:30 to 9:00 p.m.

Interested persons may also call or write for additional information. DEQ names and contact are listed at the end of the Fact Sheet.

Please note: The Public comment period ends June 15, 2001.

PROCEDURES FOR REACHING A FINAL DECISION ON PERMIT ISSUANCE

40 CFR 124.10 as incorporated by reference in ARM 17.53.1201, require the public be given forty-five (45) days to comment on each draft permit prepared under the Resource Conservation and Recovery Act (RCRA). The comment period for the BNSF draft permit will begin on May 2, 2001, and will end on June 15, 2001. Any persons interested in commenting on the draft permit must do so within this 45 day period.

Oral and written comments may also be submitted during the public hearing to be held on May 23, 2001 from 6:30 to 9:00 p.m. at the Methodist Club House in Paradise, Montana. During the hearing reasonable limits may be set on the time allowed for oral statements, and the submission of statements in writing may be required. A tape recording or written transcript of the hearing shall be made available to the public.

The draft permit, EA, and Statement of Basis will be available for review 8:00 a.m. to 5:00 p.m., Monday through Friday, at the following locations:

Department of Environmental Quality Air & Waste Management Bureau 1520 E. 6th Ave. Helena, MT (406) 444-3490	Plains Public Library 108 West Railroad Plains, MT (406) 826-3101

All persons wishing to comment on the draft permit conditions should submit their comments in writing to:

Ann Kron
DEQ, Permitting and Compliance Division
Air & Waste Management Bureau
P.O. Box 200901
Helena, MT 59620-0901
(406) 444-5824

Comments should include all reasonably available references, factual grounds for comments, and supporting material.

When DEQ and EPA make a final decision to issue, deny, or change the draft permit, notice will be given to the applicant and each person who submitted written comments or requested a notice of the final decision. The final permit decision shall become effective thirty (30) days after the service of notice of the decision, unless a later date is specified or public hearing is requested under 40 CFR 124.11 as incorporated by reference in ARM 17.53.1201. If no comments are received requesting a change in this draft permit, the final permit shall become effective immediately upon issuance.

FOR MORE INFORMATION

Please contact the person listed above for further information.

ENVIRONMENTAL ASSESSMENT (EA)

Montana Hazardous Waste Permit Number: MTHWP-01-02

Issued to: Burlington Northern & Santa Fe Railway Company

Legal Description: NW 1/4 Section 20, SE 1/4 Section 18, SW 1/4 Section 17
Township 19 North, Range 25 West
Sanders County, Montana

Issued by: Hazardous Waste Section
Air and Waste Management Bureau
Permitting and Compliance Division

Purpose of the EA:

The Montana Department of Environmental Quality (DEQ) is required under the Montana Environmental Policy Act (MEPA) to conduct an environmental assessment (EA) on the proposed permit action described below. An EA documents all reasonable alternatives to DEQ's permit action and outlines the potential impacts to the human environment resulting from DEQ's permitting action and the reasonable alternatives. Based on the impact analysis and professional judgement, DEQ makes a decision on the proposed permit action and summarizes the decision in the EA. If the decision may significantly impact the human environment, a more detailed environmental review called an environmental impact statement, must be conducted by DEQ.

Description of Proposal:

Summary:

The Montana Department of Environmental Quality (DEQ) intends to re-issue a hazardous waste operating permit to Burlington Northern & Santa Fe (BNSF) Railway Company for the operation of a corrective action management unit (CAMU), post-closure care of a surface impoundment and waste pile, closure of a land treatment demonstration plot and a section of the surface impoundment, facility-wide corrective action, and incorporation of a corrective action remedy. This draft hazardous waste operating permit (MTHWP-01-02) is a re-issuance of MTHWP-88-03 issued by DEQ and the facility-wide corrective action permit issued by EPA in 1989. MTHWP-01-02 is issued under the authority of the MHWA, Montana Code Annotated, Title 75, Chapter 10, Part 4 and according to the Administrative Rules of Montana (ARM) Title 17, Chapter 53.

Facility Background:
BNSF operated a wood treating operation at the Paradise Tie Treating Plant (Paradise Site) from 1908 until 1982. During the operation of the facility, an abandoned channel of the Clark Fork River was utilized as a surface impoundment for the disposal of creosote wastewaters.

The Paradise Site is located between Highway 200 and the Clark Fork River, in Paradise, Montana. The Site has four hazardous waste management units regulated by DEQ: the surface impoundment (SI), the waste pile unit, the land treatment demonstration plots, and the land treatment unit (LTU).

Land treatment, landfarming, is a method of degrading creosote-contaminated wastes by applying them to soil, which is then tilled and fertilized. Microbes in the soil degrade the waste to a less hazardous form. Land treatment has been successfully employed to degrade creosote wastes for many years.

BNSF has proposed the LTU and a portion of the Surface Impoundment (SI) be designated a Corrective Action Management Unit (CAMU). The CAMU will be used for the treatment of remediation waste encountered at the site. Remediation wastes will include contaminated soils, treated and untreated groundwater, sediments, sludges, and spent granular activated carbon from the product recovery operations.

Please see the attached Fact Sheet for a more detailed description of the permit reissuance.

Permit Background:
The Resource Conservation and Recovery Act (RCRA) is the federal law under which regulations concerning the management, treatment, storage or disposal of hazardous waste are implemented. The Montana Hazardous Waste Act (MHWA) is the State equivalent of RCRA. MHWA regulations require facilities with land treatment units to obtain a hazardous waste

operating permit.

Hazardous waste operating permits are issued for a period of 10 years. At the end of this period, the Permittee may apply for renewal of the permit. The State of Montana issued the current operating permit for the Paradise Site on December 30, 1988. BNSF submitted a final application for permit reissuance in July 1999.

BNSF's application is complete, meets the requirements of ARM 17.53.1200 et seq., and is protective of human health and the environment; therefore, a draft permit has been prepared based on the application. This draft permit is issued under Title 75, Chapter 10, Part 4, of MHWA and will replace MTHWP-88-03 when finalized.

In 1984, Congress amended RCRA. The amended law, titled the Hazardous and Solid Waste Amendments of 1984 (HSWA), includes a requirement that owners and operators of hazardous waste facilities remediate releases of hazardous wastes and/or hazardous constituents from solid waste management units (SWMUs) and areas of concern (AOCs). A SWMU is any unit that was used at any time to manage waste, regardless of whether the unit was intended for that purpose. An AOC is any area at a facility having a probable release of a hazardous waste or hazardous constituent that may or may not be from a SWMU. The HSWA corrective action requirements are established in Section 3004(u) of RCRA and are codified in federal regulations at 40 CFR Section 264.101, as incorporated by reference in ARM 17.53.801.

Through HSWA, Congress required permits issued to hazardous waste facilities to contain corrective action requirements for SWMUs/AOCs. In November 1989, EPA issued a corrective action permit to BNSF requiring: (a) identification of SWMUs/AOCs at the facility, (b) identification of any releases that have occurred or are occurring from those units, and (c) appropriate facility-wide corrective action to clean up those releases.

On December 26, 2000, MDEQ was authorized to implement the requirements of HSWA. The draft hazardous waste operating permit incorporates corrective action requirements for BNSF's SWMUs/AOCs and in its final version will replace EPA's 1989 corrective action permit.

- Since 1989, BNSF has identified 20 SWMUs/AOCs at the Paradise Site. See attachment A of the draft permit for a listing of all SWMUs/AOCs, their status in the corrective action process, and a map showing their locations. EPA and DEQ have tentatively selected a remedy for the SWMUs/AOCs at BNSF that are identified as needing further action.

Need for Proposal:

The need for this permit is threefold:

1. The permit requires BNSF to continue facility-wide corrective action. Corrective action is mandated by law for owners and operators of hazardous waste land treatment units.
2. BNSF's current hazardous waste permits issued by DEQ and EPA are due for re-issuance. In addition, Montana has been authorized by EPA to implement the requirements of HSWA. Therefore, the permit incorporates the requirements of both the operating permit and HSWA permit into one permit and reflects DEQ's new corrective action leadership.
3. The permit incorporates the selected remedy for corrective action and allows for public comment on that remedy.

Objectives of Proposal:

The objectives of this permit re-issuance include:

- Incorporating facility-wide corrective action and the hazardous waste operating permit requirements into one permit;
- Incorporating a remedy selection for facility-wide corrective action into the permit;
- Providing environmental protection through permit requirements to operate and close the regulated units; and
- Updating permit requirements and permit format.

Alternatives Considered:

I. Proposed Action

Under this alternative, DEQ would issue BNSF MHWP-01-02, considering all comments received during the public comment period. **Please see the attached Fact Sheet for**

information on the public comment period and further details on requirements in the draft permit.

The proposed action would include:

- Operation of a CAMU.
    - Land Treatment Unit:
      Operation of a CAMU would include treating creosote contaminated wastes found at the site in an on-site land treatment unit. Wastes would include soils, sludges, sediment, treated and untreated groundwater, and granular activated carbon.
    - Product Recovery System.
      Operation of a CAMU also includes a system that recovers creosote that has pooled at the bottom of the aquifer and also collects and treats creosote contaminated groundwater. Treated water is re-infiltrated into the ground, and untreated groundwater is either run through the product recovery system until it reaches treatment standards, or is placed on the land treatment unit.
- Continued post-closure care of the surface impoundment and waste pile. This will include soil, soil-pore liquid, and groundwater monitoring. This is conducted to ensure that contamination is not migrating off-site and posing risk to human health and the environment.
- Closure of the land treatment demonstration plot. Soil will be excavated from the demonstration plot to a minimum of 5 feet below ground surface (bgs) and placed on the land treatment unit.
- Closure of a section of the surface impoundment, located in Section 18. Soil will be excavated to a minimum of 2 feet bgs and placed on the land treatment unit.
- Incorporating the facility-wide corrective action remedy into the permit. DEQ and EPA proposed a remedy that entails excavating contaminated soils in any SWMUs/AOCs that are identified as needing further action, placing the soils on the land treatment unit, and backfilling the excavated areas with clean fill. See the statement of basis included with this environmental assessment, or in Attachment A of the draft permit for information on the proposed remedy.

II. Not issue a CAMU

Under this alternative, DEQ would deny BNSF's request to designate the land treatment unit and a portion of the surface impoundment as a CAMU. By denying this request, BNSF could not treat any newly generated or discovered wastes on-site. Corrective action would still be required, however, the remedy selected by DEQ and EPA would have to be revised to accommodate alternative disposal/treatment methods for remediation wastes. This alternative was not considered because the Department believes the operating requirements and the closure standards for the CAMU, as set forth in the draft permit, are reasonable and safe standards for the site. Therefore, the Department believes it would not be reasonable to deny BNSF's request for a designated CAMU at the Paradise Site.

III. Transport wastes off-site

This alternative consists of transporting wastes generated at the Paradise Site to a commercial treatment facility. This alternative was reviewed by DEQ, but was not considered to be either as reasonable or prudent as the proposed action. The proposed action of land treating wastes would be more economically feasible to BNSF than shipping wastes to nearby commercial facilities for treatment. The department anticipates waste will be treated in an environmentally sound manner given the yearly amount of wastes projected for treatment, the proven viability of land treating creosote wastes, and conditions within the permit concerning operating requirements.

IV. Alternative treatment or disposal

This alternative includes any other alternative options for the treatment and/or disposal of hazardous waste generated at the Paradise Site. This alternative was not considered since landfarming has proven to be a viable treatment for creosote wastes.

V. No Action

Under this alternative DEQ would deny BNSF's permit application and not issue MTHWP-01-02. By denying the permit application, BNSF could not treat hazardous waste in an on-site corrective action management unit. A corrective action permit would still be have to be issued because BNSF is required to complete the corrective action process. This alternative was not considered because BNSF has shown compliance with conditions of the operating permit throughout its 12-year duration. Therefore, the Department believes it would not be a reasonable alternative to deny permit issuance.

Stipulations and Controls:

BNSF must meet all requirements of their hazardous waste operating and corrective action permit and any applicable requirements of the MHWA. The permit requires testing of soils and monitoring of soil-pore liquid and groundwater at specified times throughout the year and requires remediation of SWMUs/AOCs. The Permittee must submit a written report after each sampling event, comprehensive annual reports, and remedy implementation work plans and reports.

Currently, requirements of the operating permit, except for the CAMU, are enforced by DEQ. The State of Montana has not yet been authorized by EPA to implement the requirements of the CAMU; therefore, EPA will take the lead on oversight of the CAMU portion of the permit until the State of Montana is authorized for implementation of the CAMU.

Analysis of Regulatory Impacts on Private Property Rights:

See attached "Private Property Assessment Act Checklist".

Summary of Impacts:

This summary was completed for Alternative I only. Alternatives II, III, IV, and V were not considered to be reasonable alternatives. Tables 1 and 2 rate the potential human environment impacts from reissuing MTHWP-01-02 according to Alternative II. The human environment includes those attributes, such as biological, physical, social, economic, cultural, and aesthetic factors, that interrelate to form the environment. Impacts may be adverse, beneficial, or both. The following criteria are used to rate the impacts:

- The severity, duration, geographic extent, and frequency of occurrence;
- The probability the impact will occur if the proposed action occurs;
- Growth-inducing or growth-inhibiting aspects of the impact;
- The quantity and quality of each environmental resource or value affected;

- The importance to the State and society of each environmental resource or value affected;
- Any precedent set as a result of an impact from the proposed action that would commit DEQ to future actions with significant impacts or a decision in principle about such future actions; and
- Potential conflict with local, state, or federal laws, requirements, or formal plans.

The following are definitions for major, moderate, minor, none, and unknown impacts on the human environment:

- Major: A significant change from the present condition of the human environment. Major impacts are serious enough to warrant preparing an environmental impact statement (EIS).
- Moderate: Not a major or minor change from the present condition of the human environment. A single moderate impact may not warrant preparing an EIS; however, when considered with other impacts, an EIS may be required.
- Minor: A slight change from the present condition of the human environment. Minor impacts are not serious enough to warrant preparing an EIS.
- None: No change from the present condition of the human environment.

Unknown: An EIS must be conducted to determine the effects on the human environment if impacts are unknown.

TABLE 1: POTENTIAL IMPACTS ON PHYSICAL AND BIOLOGICAL ENVIRONMENT.

Resource	Major	Moderate	Minor	None	Unknown	Discussion Attached
A. Air Quality				√		
B. Water Quality, Quantity, and Distribution				√		
C. Geology and Soil Quality, Stability, and Moisture			√			√
D. Historical and Archaeological Sites				√		
E. Aesthetics				√		
F. Terrestrial and Aquatic Life and Habitats				√		
G. Vegetation Cover, Quantity, and Quality			√			√
H. Unique, Endangered, Fragile, or Limited Environmental Resources				√		
I. Demands on Environmental Resources of Water, Air, and Energy				√		
J. Cumulative and Secondary Impacts				√		

Key: √ =**Alternative I**

TABLE 2: POTENTIAL IMPACTS ON SOCIAL, ECONOMIC, & CULTURAL ENVIRONMENT.

Issue	Major	Moderate	Minor	None	Unknown	Discussion Attached
A. Social Structures and Mores				√		
B. Cultural Uniqueness and Diversity				√		
C. Local and State Tax Base and Tax Revenue				√		
D. Agricultural or Industrial Production				√		
E. Human Health				√		
F. Access to and Quality of Recreational and Wilderness Activities				√		
G. Quantity and Distribution of Employment				√		
H. Distribution of Population				√		
I. Demands for Governmental Services			√			√
J. Industrial and Commercial Activity			√			√
K. Locally Adopted Environmental Plans and Goals				√		
L. Cumulative and Secondary Impacts				√		

Key: **√=Alternative I**

Discussion of Table 1.:

Potential Impacts on Physical and Biological Environment from Alternative I

C. *Geology and Soil Quality, Stability, and Moisture:* Not applying wastes to the LTU could improve soil quality as microbes in the soil are given more time to degrade the waste already placed on the LTU to a less hazardous form.

F. *Vegetation Cover, Quantity, and Quality:* The LTU has been seeded with native grasses as required by the hazardous waste operating permit. The use of the LTU and SI as a CAMU will require tilling and obtaining soil samples from the LTU; thereby disturbing the vegetative cover.

Excavation of soils from the land treatment demonstration plots, Section 18 of the surface impoundment, and SWMUS/AOCs will disturb the vegetative cover on those areas.

Discussion of Table 2.:

Potential Impacts on Social, Economic, & Cultural Environment from Alternative I

I. *Demands for Governmental Services:* DEQ personnel will review results from sampling the CAMU and determine whether BNSF's conclusions, recommendations for future operations, and possible remediation plans for the CAMU and SWMUs are accurate and complete.

J. *Industrial and Commercial Activity:* BNSF will hire a consultant to complete the sampling activities and send the samples to an external laboratory for analysis.

Individuals or Groups Contribution to this EA:

Burlington Northern & Santa Fe (BNSF) Railway Company; Environmental Protection Agency

Other Groups or Agencies Contacted or Having Overlapping Jurisdiction:

The Environmental Protection Agency (EPA)

EA Prepared by: Ann M. Kron

Date: 3/14/2001

RECOMMENDATIONS

Recommended Alternative:

Alternative I (the proposed action) is the recommended alternative. Under this alternative, DEQ would request public comment on the draft hazardous waste operating permit reissuance. The final permit reissuance will take into account all comments received during the public comment period.

Explanation of Recommended Course of Action:

Alternative I is the recommended course of action. BNSF has submitted a complete permit application that meets the requirements of ARM 17.53.1200 et seq. and is protective of human health and the environment. Therefore, it would not be a reasonable alternative to deny the permit reissuance.

STATEMENT OF BASIS
BURLINGTON NORTHERN & SANTA FE RAILWAY COMPANY
PARADISE TIE TREATING PLANT SITE
PARADISE, MONTANA

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
MAY, 2001

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

DEQ Announces Proposed Decision for Treatment and Control of Contaminated Soils at the Paradise Tie Treating Plant

PUBLIC COMMENT PERIOD: May 2, 2001 through June 15, 2001
PUBLIC MEETING: Wednesday, May 23, 2001

LOCATION: Methodist Clubhouse
Paradise, Montana

TIME: 6:30 – 9:00 p.m.

SITE INFORMATION:

Plains Public Library
108 West Railroad
Plains, MT 59859

Montana Department of Environmental Quality
1520 East Sixth Street
Helena, MT 59620

SEND COMMENTS TO:
Ann Kron
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901
Fax: (406) 444-1499
Phone: (406) 444-5824

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DECISION SUMMARY

The Department of Environmental Quality (DEQ) has determined that the proposed Alternative 4 remedy, as described in this Statement of Basis and the draft hazardous waste permit, is the best proposed remedy for addressing risks from potential exposure to contaminated surface soils at the Paradise Site owned by BNSF. Alternative 4 provides permanent reduction in the contaminant mass through biological treatment at the permitted on-site land treatment unit (LTU). Other treatment methods may provide faster treatment, but at much greater cost. The preferred soil remedy involves excavation of the contaminated surface soils, biological treatment of the contaminated soil in the on-site LTU, backfilling the excavated areas with clean soil, and establishing a vegetative cover over the areas. BNSF evaluated several alternative remedies for the soil contamination. DEQ considered all of the corrective measures options and their components evaluated by BNSF. DEQ and EPA worked together closely in evaluating the alternatives and the preferred remedy. Through the remedial actions and institutional/government controls, risk posed by the site surface soils will not exceed the acceptable one-in-a-hundred-thousand cancer risk level to the public. The preferred surface soil remedy will be protective of human health and the environment.

SITE INFORMATION

The Montana Department of Environmental Quality (DEQ) is proposing a remedy for the treatment and control of contaminated surface soil at the site of the former Paradise Tie Treating Plant (Paradise Site) owned by Burlington Northern and Santa Fe Railway Company (BNSF). The Paradise Site is located in northwestern Montana near the Town of Paradise.

INTRODUCTION

Because BNSF managed hazardous waste on-site they were required to obtain a hazardous waste permit under the Resource Conservation and Recovery Act (RCRA) and the Montana Hazardous Waste Act (MHWA). RCRA is the federal law under which regulations concerning the management, treatment, storage, and disposal of hazardous waste are implemented. The MHWA is the state equivalent to RCRA. The Hazardous and Solid Waste Amendments of 1984 (HSWA) amended RCRA and included a requirement that owners and operators of hazardous waste facilities remediate releases of hazardous wastes or hazardous constituents from solid waste management units (SWMUs) and areas of concern (AOCs). A SWMU is any unit that was used at any time to manage waste, regardless of whether the unit was intended for that purpose. For example, the drip track area is a SWMU because waste creosote dripped off the drying railroad ties and into the soil over time. An AOC is any area at a facility having a probable release of a hazardous waste or hazardous constituent that may or may not be from a SWMU. The HSWA corrective action requirements are established in Section 3004(u) of RCRA and 75-10-406(7) Montana Code Annotated (MCA) of MHWA. The requirements are codified in federal regulations at 40 Code of Federal Regulations (CFR) Section 264.101, as incorporated by reference in the Administrative Rules of Montana (ARM) 17.53.801.

Through HSWA, Congress required permits issued to hazardous waste facilities contain corrective action requirements for SWMUs/AOCs. The Montana Legislature has directed the DEQ to adopt a state equivalent program. The DEQ was authorized as the lead for corrective action in 2000. BNSF managed wastes in a number of SWMUs and AOCs at the Paradise Site. Some of these units contain creosote-contaminated soils or contaminated groundwater that require remediation. In 1989, the Environmental Protection Agency (EPA) issued a HSWA Permit for the Paradise Site which required BNSF to investigate all facility SWMUs/AOCs and develop a corrective measures study for the SWMUs/AOCs which are contaminated above acceptable levels. Figure 1 shows the locations of the SWMUs and AOCs at the Paradise Site. Under State authority the remedy selection is incorporated into the new hazardous waste permit.

CORRECTIVE ACTION PROCESS

The corrective action process generally comprises six activities. These activities are not always undertaken as a linear progression towards final facility cleanup, but can be implemented flexibly to most effectively meet site-specific corrective action needs. These six activities are:

RCRA Facility Assessment (RFA)

Often the first activity in the corrective action process is the RFA. The objective of the RFA is to identify potential and actual releases from SWMUs/AOCs and make preliminary determinations about releases, the need for corrective action, and interim measures. The EPA completed the RFA for the Paradise Site in 1989.

Interim/Stabilization Measures:

Interim/stabilization measures are short-term actions taken to respond to immediate threats to human health or prevent damage or contaminant migration to the environment. Interim or stabilization measures may be taken at any time in the corrective action process. BNSF has completed several interim measures since the closing of the site. Further information on these can be found in the Interim Measures section of this document.

RCRA Facility Investigation (RFI)

The RFI takes place when releases, or potential releases, have been identified and further investigation is necessary. The purpose of the RFI is to gather enough data to fully characterize the nature, extent, and rate of migration of contaminants to determine the appropriate response action. For the Paradise Site, a Phase I RFI report was completed in June 1994 and a Phase II RFI report was completed in July 1996.

Corrective Measures Study (CMS)

After the RFI is completed and the regulatory agency determines that cleanup is necessary, the regulatory agency may request the owner/operator to conduct a CMS. The purpose of the CMS is to identify and evaluate cleanup alternatives, called corrective measures, for releases at the facility. The recommended measures are reviewed by the regulatory agency. The regulatory agency then selects the best remedy, given the site-specific considerations. When a remedy is selected, the facility's permit is modified to include the remedy and is subject to public review and comment. The selected remedy for the Paradise Site will be included in the current permit reissuance. The CMS was completed in July 1999. DEQ and EPA conditionally approved a remedy in August 2000.

Statement of Basis

This document describes the basis for remedy selection and provides the public with an opportunity to comment on the remedy. When selecting a remedy the following are considered: short- and long-term reliability and effectiveness; reduction of toxicity, mobility, or volume of hazardous constituents; implementability; and costs.

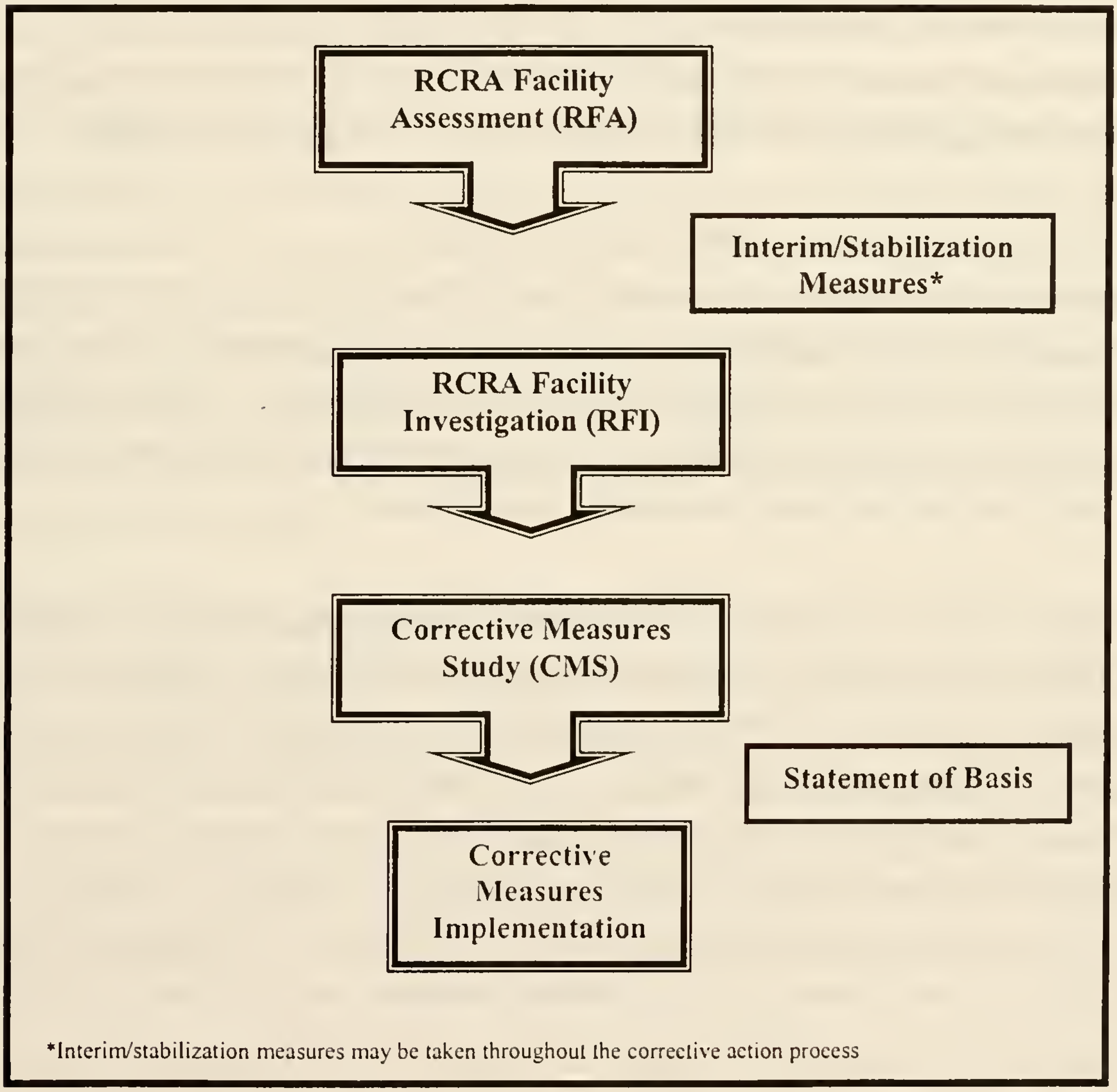
Corrective Measures Implementation (CMI)

Once a remedy has been selected, the facility enters the CMI phase of corrective action. During the CMI, the owner/operator of the facility implement the chosen remedy. Requirements for the CMI for the Paradise Site are included in the draft permit.

See Figure 2 for a flowchart showing the corrective action process.

The purpose of this document, which is called a Statement of Basis, is to 1) identify the proposed corrective action remedy and explain the reasons for its selection, 2) describe all the remedies considered, 3) seek public review and comment on all remedies considered and on any other plausible remedies, and 4) provide information on how the public can be involved in the remedy

Figure 2. Flowchart of the RCRA Corrective Action Process


RCRA Facility Assessment (RFA)
Interim/Stabilization Measures*
RCRA Facility Investigation (RFI)
Corrective Measures Study (CMS)
Statement of Basis
Corrective Measures Implementation

*Interim/stabilization measures may be taken throughout the corrective action process selection process. DEQ encourages residents and other interested parties to read and comment on this Statement of Basis and the CMS done by BNSF to evaluate remedy alternatives. BNSF performed a CMS of several options for correcting surface soil contamination problems at the Paradise Site.

A final remedy for the site surface soils will be selected only after the public comment period has ended and the DEQ has reviewed and considered the information submitted during this period. Changes may be made to the proposed remedy or another remedy selected if public comments or additional data indicate the changes would result in a more appropriate solution. DEQ will summarize the comments and provide responses at the end of the public comment period. The comment summary and DEQ's responses will become part of the public record for the site.

PROPOSED REMEDY

DEQ proposes to address surface-soil contamination at the Paradise Site by excavation and on-site treatment. Contaminated soil would be excavated from former SWMUs at the site. The excavated areas would then be backfilled with clean fill and soil, and a vegetative cover would be established on the area. The excavated soil would be treated on site at the existing Land Treatment Unit (LTU). A list of the SWMU can be found in Appendix A of the draft permit.

Land treatment at the site involves the controlled application of creosote contaminated material to the soil surface and incorporation of that material into the upper soil zone. The objectives of land treatment are to transform, immobilize, and degrade hazardous contaminants within the upper five feet of the soil. This is called the treatment zone. Aerobic microorganisms in the soil break down and degrade organic contaminants into less harmful compounds. Land treatment of creosote-impacted soil first occurred in the fall of 1989 in the Paradise LTU. During LTU operation, the total levels of creosote-related contaminant were reduced by 99 percent. The last waste application on the LTU was in 1994. Currently, the LTU is closed and no new waste is allowed to be treated on the unit.

The existing LTU can be reopened to treat the contaminated soils if DEQ approves its use as a special area for treating site cleanup wastes. Such an area is known as a corrective action management unit (CAMU). The CAMU could only be used to treat contaminated material related to the cleanup of the Paradise Site. BNSF would operate the LTU as a CAMU according to the requirements of the hazardous waste permit. After the treatment standards are met, BNSF would be required to close the CAMU. DEQ is required to justify the reasons for approving the CAMU and make the information available to the public. The CAMU justification is provided in Attachment A of this document. The public comment period for the selected soil remedy also includes the opportunity for the public to comment on the use of the LTU as a CAMU.

BACKGROUND

The Paradise Site is located about three-quarters of a mile northwest of the Town of Paradise and five miles south of the town of Plains. The unincorporated Town of Paradise is the only population center within five miles. The site is south of Highway 200, on the northern bank of the Clark Fork River. BNSF and its predecessors owned the property between the river and the primary railroad tracks at the time of tie treating operations. Currently, a rail right-of-way extending 200 feet on either side of the railroad tracks is owned by Montana Rail Link. The site land use was industrial and agricultural prior to abandonment of the railroad tie treating facility in 1982. The BNSF property currently has mixed land use including agriculture, and open space. A portion of the site consists of an inactive LTU and a closed surface impoundment currently regulated by a hazardous waste permit issued by DEQ.

The former tie treating plant operated from 1908 to 1982. Creosote was the only wood preservative known to have been used at the plant. Creosote is produced from coal tar and is a mixture of hundreds of compounds, primarily semi-volatile organic compounds. Polynuclear aromatic hydrocarbons (PAHs) are semi-volatile organic compounds that generally account for 85 percent (by weight) of the chemical constituents of creosote. Creosote is denser than water. When creosote is released to groundwater it typically collects at the bottom of aquifers as a dense non-aqueous phase liquid (DNAPL).

Railroad ties were treated with creosote at elevated pressures and temperatures in the treatment (retort) building. Wastewater from the plant was discharged through a buried pipe into a surface impoundment located southwest of the plant site. The impoundment is a former channel of the Clark Fork River and was used during plant operations as a settling basin for recovery and reuse of creosote.

Freshly treated ties were transported to the drip track area west of the treatment building. The area consisted of two parallel rows of narrow-gauge tracks and is approximately 1,000 feet in length and 60 feet wide. Freshly treated ties were allowed to drip onto the underlying track and soils. The depress track, south of the drip track, was used to remove the treated ties. It was located five feet lower than the drip track to make it easier to load treated ties onto boxcars. The depress track area is about 1,800 feet long and 30 feet wide. A retaining wall was built between the drip track and depress track. Three notches in the retaining wall allowed surface liquids to drain from the drip track into the depress track area.

BNSF was required to perform a site-wide investigation and clean up by the EPA under a Waste Minimization and Corrective Action Permit (EPA Permit). EPA issued the permit to BNSF (then Burlington Northern Railroad) for the Paradise Site in 1989. The EPA Permit required BNSF to investigate and correct releases of hazardous wastes and constituents from the identified SWMUs and AOCs.

EPA identified 22 SWMUs/AOCs at the Paradise Site during a RFA of the site in 1989. EPA then required that BNSF perform a RFI to investigate the contamination related to the SWMU/AOCs. A risk assessment was performed to ascertain risks to human health and the environment from exposure to the site contamination.

Upon review of the RFI and risk assessment, EPA required BNSF to include eight SWMUs in the CMS because of unacceptable risks to human health or the environment (SWMUs 6, 7, 10, 12, 13, 15, 17, and 18). Through further investigation, it was determined that SWMU 6 did not need to be included in the corrective action remedy at the site.

Reports from the CMS, RFI, and Risk Assessment are available at the public library in Plains, Montana. This Statement of Basis highlights key information from, but is not a substitute for, those documents.

In 1989, the State of Montana's DEQ issued BNSF a hazardous waste Part B Permit for post-closure care of the surface impoundment. The impoundment was contaminated with creosote sludges from wastewater discharge. The sludge that collected in the surface impoundment was classified as a hazardous waste in 1980 (EPA hazardous waste code K001). BNSF closed the impoundment in 1984, and recovered the creosote from the impoundment for reuse at the tie plant in Somers, Montana in 1985. BNSF removed 20,000 cubic yards of the remaining surface sludges and most contaminated soils from the surface impoundment and deposited the material into a permitted on-site waste pile in 1985. BNSF constructed the LTU and transferred the sludge and soil in the waste pile to the LTU for biological treatment in 1989, after the State approved its operation under BNSF's hazardous waste permit.

In December 2000, EPA delegated the HSWA corrective action program to the State of Montana. The DEQ is proposing to reissue BNSF's hazardous waste permit. BNSF's hazardous waste permit will incorporate the EPA Permit requirements as well as the requirement to carry out the soil remedy once selected.

SUMMARY OF SITE RISKS

As part of the RFI, BNSF performed a baseline risk assessment. A risk assessment studies the health risks of exposure to the chemicals contaminating a site. A baseline risk assessment estimates what the risks would be if there were no additional cleanup or control of the site contaminants.

The risk assessment was performed in two phases. BNSF reported the first phase of the 1993 RFI Baseline Risk Assessment (RETEC, 1993) and then reported an update of the risk assessment in the Corrective Measures Study (CMS) Workplan (RETEC, 1997). BNSF evaluated the risks to humans, plants, and animals that might be exposed to site contaminants.

In the human health risk assessment, BNSF evaluated the potential risks to industrial workers at the site and to potential future residents. (Note: BNSF has reported that future residential use of the site is not intended) BNSF determined potential risks of exposure to contaminants in the soil and groundwater at the site.

The chemicals of concern in the risk assessment were based on data from site samples collected during the RFI. Those chemicals of most concern for potential human health and the environment are the polynuclear aromatic hydrocarbons (PAHs) from creosote. Low levels of volatile organic compounds (benzene, toluene, ethylbenzene, and xylene) from former plant operations also were detected above background levels at the site. These chemicals were also included in the risk assessment.

In the human health risk assessment, BNSF evaluated both the cancer and the non-cancer health risks from exposure to the site chemicals. Cancer risks are estimated as the increased chance, over a lifetime, of a person's developing cancer as a result of exposure to a potential cancer-causing chemical (carcinogen). Non-cancer health risks were assessed by determining the hazard index (HI), or the adverse effects of being exposed to several chemicals at one time.

A baseline risk assessment conducted at the Paradise Site evaluated human health and ecological risk based on current and future land uses. The estimated cancer risks for the site are within the EPA acceptable range of one-in-ten-thousand to one-in-one-million for all potential receptors with the exception of future resident adults and children. Potential receptors included representative wildlife species characteristics of northwest Montana, industrial workers, trespassing children, construction workers, and potential future residents.

BNSF also studied the risks of contaminant exposure at each SWMU to identify the SWMUs that create the greatest risk and may need cleanup or control. Two receptors were evaluated on a SWMU-specific bases: 1) the on-site industrial worker (the most likely receptor for the site), and 2) the on-site resident child, the receptor associated with the highest potential cancer risk in the site-wide risk assessment. The SWMU-specific risk results indicated SWMUs 10, 13, 15, and 18 contributed the majority of estimated risk for both receptors. The proposed remedy addresses the contaminated surface soil at these SWMUs.

Cleanup levels for the site soils were established to ensure that in the future no person would be exposed to unsafe levels of chemicals. Action levels to protect the health of industrial workers and residents were calculated for carcinogenic PAHs (cPAH). The soil action level protective of on-site industrial workers is 40 parts per million (ppm), and 20 ppm for potential site residents.

The soil action levels for human health correspond to a 1×10^{-5} total lifetime cancer risk (i.e., one person out of a hundred-thousand is estimated to be at risk of developing cancer if the site is not cleaned up). The action level was calculated based on the relative risk and average concentration of each individual cPAH: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene. Areas of the site where the concentration of cPAHs in the surface are greater than the action levels are shown in Figure 2-2 and Table 2-7 of the CMS report.

BNSF also evaluated the potential for PAHs to impact ecological life forms (e.g. deer mouse, shrew, etc.) on-site and in surrounding ecological communities. In addition, potential impacts to off-site wildlife were evaluated including PAH migration to off-site media. The evaluation showed the most likely receptors are primarily soil invertebrates and the small vertebrate species that forage on invertebrates. The concentrations detected at the site may also cause negative impacts to both survival and reproduction in small·mammals, and possible impacts on the survival of insectivorous bird species. The risks from exposure to contaminated materials at the site are low for larger omnivorous and carnivorous species for the following reasons. The site may only represent a small portion of their foraging range and they are therefore unlikely to spend a significant amount of time onsite. In addition, PAHs do not build up in the tissues of animals that are higher in the food chain.

BNSF calculated cleanup action levels for risks to represent small mammals and invertebrates. The ecological cleanup levels are higher in concentration than the human action levels. Therefore, controlling exposure to concentrations at human health action levels would also protect the wildlife.

INTERIM MEASURES

BNSF has completed or begun several interim measures to address contamination at the site. As described above, BNSF recovered creosote from the surface impoundment and recycled it at another facility. BNSF removed the remaining sludges and contaminated soils from the surface impoundment and treated the waste at the on-site LTU after temporary storage in a waste pile. BNSF also treated 4,500 cubic yards of soil excavated from the drip track SWMU at the LTU. BNSF has begun removal of free-phase creosote from the groundwater in the former treatment building area and the southeast portion of the surface impoundment. BNSF recycles the recovered creosote at another facility outside of Montana. BNSF installed alternate municipal water supply wells for the Town of Paradise in 1987.

SCOPE OF CORRECTIVE ACTION

This proposed remedy is limited to the surface soils portion of the CMA. DEQ will propose the groundwater remedy in a future modification of BNSF's permit. Any remaining work needed to address potential sediment contamination in the Clark Fork River also will be included in a future permit modification.

SUMMARY OF ALTERNATIVES

BNSF developed the following eight remedy alternatives for addressing surface soil contamination at the Paradise Site. Several of the alternatives have common activities such as excavation.

1. No Further Action
2. Cover Impacted Areas
3. Excavation of Impacted Areas and On-Site Thermal Desorption (thermal treatment)
4. Excavation of Impacted Areas and On-Site Land Treatment (bioremediation)
5. Excavation of Impacted Areas and Off-Site Disposal

6/7. Combination of Covering Impacted Areas, Excavation, and On-Site Treatment

8. Phytoremediation Cover (vegetation) on Impacted Areas

Alternatives 2 – 8 all include the use of institutional controls, such as deed restrictions, to restrict land access and use of the impacted areas; the use of a product recovery system to recover creosote from the aquifer; and the use of long-term groundwater monitoring.

Alternative 2 – 8 also include the same corrective action remedy for SWMU 10. SWMU 10, (the depress track and retaining wall), differs from the other SWMUs in that the depression, and therefore the impacted soil, is located 8 – 10 feet below the surrounding land surface. BNSF proposed to cover SWMU 10 by filling the length of the depression to grade with clean gravel. The top two feet of fill would be clean soil with a vegetative cover.

Below are brief descriptions of each alternative.

Alternative 1 – No Further Action:

Alternative 1 would not provide any additional means to prevent exposure to contaminated soil. This alternative provides a baseline with which to compare other alternatives.

Alternative 2 – Cover SWMUs:

Alternative 2 consists of placing a two-foot clean fill cover over impacted surface soil at SWMUs 7, 12, 13, 15, 17, and 18. SWMU 10 would be filled to grade (8-10 feet) with fill. BNSF would cover the SWMU areas where the concentration of contaminants in the surface soil is greater than a health-based action level. BNSF has two estimates of the area to be covered. The smaller area is based on the soil action level for an industrial worker. The larger area is based on the soil action level for a resident.

Alternative 3 – Excavation and Thermal Desorption:

Alternative 3 involves excavation of the impacted soil from SWMUs 7, 12, 13, 15, 17, and 18 for on-site thermal treatment, and the backfilling of SWMU 10 as described in Alternative 2. Soil would be excavated and staged in a stockpile area pending treatment. A mobile thermal desorption unit would be used to heat the finer soil material in a chamber and destroy the contaminant vapors or the vapors would be cooled and collected as condensate. The condensate would be separated into oil and water. The water would be reused in the process or applied as waste to the LTU, and the oil would be recycled. BNSF estimates four to six months to obtain an air permit from DEQ for the mobile treatment unit and two months for excavation and treatment. The treated material would be used to backfill the excavated areas. The thermal treatment process requires that soil be heated to sufficient temperatures to drive off the contaminants.

Soil would be excavated to either meet industrial or residential action levels. If a larger volume of soils is excavated to meet residential action levels, unimpacted gravel would be separated from the soil, washed, and used along with the treated material as backfill in the excavation areas. Wash-water would be collected, allowed to settle, and reused in the gravel pressure wash. Settled solids and soil would thermally be treated with the fine-grained soil. Excess wash-water would be applied to the LTU.

Alternative 4 – Excavation and Land Treatment:

Alternative 4 consists of excavation of the impacted soil from SWMUs 7, 12, 13, 15, 17, and 18 for on-site land treatment (bioremediation), and the backfilling of SWMU 10 as described in Alternative 2. Impacted soil would either be excavated in one batch and stockpiled in the LTU until spreading, or excavated in smaller portions and spread directly to the LTU. SWMUs 7, 12, 13, 15, 17, and 18 would be backfilled with clean fill.

Soil would be excavated to either meet industrial or residential action levels. If a larger volume of soils is excavated to meet residential action levels, unimpacted gravel would be separated from the soil, washed, and used along with the treated material as backfill in the excavation areas. Wash-water would be collected, allowed to settle, and reused in the gravel pressure wash. Settled solids and soil would be treated with the fine-grained soil. Excess wash-water would be applied to the LTU.

Land treatment involves the controlled application of impacted material to the soil surface and incorporation of that material into the upper soil zone. The objectives of land treatment are to transform, immobilize, and degrade hazardous contaminants within the treatment zone of the soil (usually the upper five feet). The bioremediation technology makes use of the breakdown and transformation of organic contaminants by aerobic microorganisms in the upper soil layer. Land treatment of creosote contaminated soil was initiated at the Paradise Site in 1989. During that time, the total levels of the creosote-related contaminants were reduced by 99 percent in the Paradise LTU. BNSF estimates three years to biodegrade the excavated soil on the LTU.

Alternative 5 – Excavation and Off-Site Disposal:

Alternative 5 involves excavation of the impacted soil from SWMUs 7, 12, 13, 15, 17, and 18 for off-site disposal, and backfilling SWMU 10 as described in Alternative 2. SWMUs 7, 12, 13, 15, 17, and 18 would be backfilled with clean fill.

Soil would be excavated to either meet industrial or residential action levels. If a larger volume of soils is excavated to meet residential action levels, unimpacted gravel would be separated from the soil, washed, and used along with the treated material as backfill in the excavation areas. Wash-water would be collected, allowed to settle, and reused in the gravel pressure wash. Settled solids and soil would be sent off-site for disposal. Excess wash-water would be applied to the LTU.

Only specially licensed and trained haulers would be allowed to transport the contaminated material. Open trucks would not be allowed. The finer soil material would be transported to a permitted hazardous waste disposal facility. Excavation and separation would take approximately one month.

Alternative 6 – Covering, Excavation, and Land Treatment:

Alternative 6 represents a combination of Alternatives 2 and 4. Impacted soils at SWMUs 12, 13, and 18 would be covered as described in Alternative 2 to either meet industrial or residential action levels. SWMU 10 would be backfilled as described for Alternative 2. Impacted soils from SWMUs 7, 15, and 17 would be excavated and land treated on-site.

Soil from SWMUs 7, 15, and 17 would be excavated to meet either industrial or residential action levels. If a larger volume of soils is excavated to meet residential action levels, unimpacted gravel would be separated from the soil, washed, and used as backfill in the excavation areas. Wash-water would be collected, allowed to settle, and reused in the gravel pressure wash. Settled solids and soil would land treated on-site. Excess wash-water would be applied to the LTU.

Alternative 7 – Covering, Excavation, and Land Treatment:

Alternative 7 represents a combination of Alternative 2 and 4. Impacted soils at SWMUs 12, 13, 15, and 18 would be covered as described in Alternative 2 to either meet industrial or residential action levels. SWMU 10 would be backfilled as described for Alternative 2. Impacted soils from SWMUs 7 and 17 would be excavated and land treated on-site.

Soil would be excavated to meet either industrial or residential action levels. If a larger volume of soils is excavated to meet residential action levels, unimpacted gravel would be separated from the soil, washed, and used as backfill in the excavation areas. Wash-water would be collected, allowed to settle, and reused in the gravel pressure wash. Settled solids and soil would be treated with the fine-grained soil. Excess wash-water would be applied to the LTU.

Alternative 8 – Phytoremediation:

Alternative 8 would involve phytoremediation of surface soils in SWMUs 7, 12, 13, 15, 17, and 18, and backfilling SWMU 10 as described for Alternative 2. A vegetative cover would be established to enhance biodegradation for the long-term treatment of surface soil impacts. Six-inches of topsoil would be applied to SWMUs 12, 13, and 18 due to the high concentration of contaminants. No soil cover would be added to SWMUs 7, 15, or 18. A fescue/ryegrass/clover mixture will be planted in the SWMUs. Supplemental organic matter (manure or composted manure/sawdust) and fertilizer would be added to support vegetative growth and the establishment of these native grasses. Supplemental irrigation might be necessary to establish and maintain a healthy vegetative cover.

EVALUATION OF THE PROPOSED REMEDY

DEQ is proposing Alternative 4 to address soil contamination associated with SWMUs 7, 10, 12, 13, 15, 17, and 18. Alternative 4 consists of excavation of the impacted soil from SWMUs 7, 12, 13, 15, 17 and 18 for on-site land treatment and backfilling SWMU 10 as described for Alternative 2. However, DEQ's preference for backfill material for SWMUs 7, 12, 13, 15, 17, and 18 is imported clean soil with a vegetative cover as originally proposed and evaluated by BNSF in the first version of the CMS. Similarly the proposed measure for SWMU 10 would include at least two-feet of imported clean soil with cover vegetation. Clean gravel could be used for the underlying fill material at SWMU 10 (i.e., from two feet below grade to the current depth of the SWMU). DEQ proposes excavation and treatment of soils to the industrial action level of 40-ppm cPAHs. Impacted soil would either be excavated in one batch and stockpiled in the LTU until spreading or excavated in smaller portions and spread directly to the LTU. SWMUs 7, 12, 13, 15, 17, and 18 would be backfilled with clean fill. Access to and use of the site SWMUs and CAMU would be restricted indefinitely by institutional controls.

BNSF would only be allowed to treat remediation wastes from the site cleanup at the site's LTU. The contaminated soil at the site must be managed as hazardous waste because it was contaminated by listed hazardous wastes. To prevent significant complications and costs for site cleanups, laws allow relief from specific requirements when cleanup wastes, such as contaminated soil, are treated in a unit designated as a corrective action management unit (CAMU). DEQ is proposing to designate the LTU and a portion of the surface impoundment at the Paradise Site as a CAMU so it can be reopened to treat wastes from the remaining site cleanup activities.

Based on the CMS, BNSF proposed Alternative 7 as the corrective measure to control exposure to impacted soil at the seven SWMUs requiring corrective action. Alternative 7 involves placing a 24-inch thick gravel cover over impacted surface soil in the impacted areas of SWMUs 12,13, 15, and 18 to prevent exposure to the soil. In addition, surface soil exceeding the industrial action level in SWMUs 7 and 17 would be excavated and treated in the LTU. These areas would be backfilled with gravel. SWMU 10 would be backfilled to grade with gravel.

DEQ and EPA prefer a modified Alternative 4 as the corrective measure to address soil impacts. The modified Alternative 4 differs from Alternative 7 in two ways: 1) contaminated surface soil would be excavated and land treated from SWMUs 7, 12, 13, 15, 17, and 18 instead of excavating and land treating soils from SWMUs 7 and 17; and 2) clean soil would be used to backfill these SWMUs instead of gravel. DEQ and EPA prefer Alternative 4 because it offers permanent reduction of the contamination for SWMUs 12, 13, and 1, rather than controlling exposure with a gravel cover at those SWMUs. Based on modeling performed by BNSF, they have determined that there will be little change in the concentration of the soil contaminants even after 100 years without biodegradation. Permanent reductions in toxicity, mobility, or volume are preferred to exposure control. Permanent reductions are protective of human health and the environment in the long-term and remove the risks associated with the potential failure of engineering or institutional controls. A good example of the potential failure of institutional controls was demonstrated when BNSF's predecessors lost control over a portion of land that they planned to include in the corrective action remedy for the surface impoundment. Permanent reductions in site contaminants will require less reliance on institutional controls to limit exposure to site contaminants.

SELECTION CRITERIA

DEQ and EPA evaluated the alternatives to identify which remedy would provide the best relative combination of the following four criteria: 1) be protective of human health and the environment; 2) attain media cleanup standards; 3) control the source(s) of releases to reduce or eliminate, to the extent practicable, further releases of hazardous waste (including hazardous constituents) that might pose threats to human health or the environment; and 4) comply with applicable standards for waste management. Remedies may attain cleanup standards through various combinations of removal, treatment, engineering, and institutional controls.

To ensure the remedy chosen best meets the four criteria listed above, each potential remedy was assessed in the following areas:

- Technical Performance: Based on performance, reliability, implementability, and safety. Performance was evaluated on the effectiveness and useful life of the alternative. Reliability was evaluated based on the operation and maintenance requirements and the demonstrated reliability of the approach. The implementability of each potential remedy was measured by its constructability or ease of installation, operation and maintenance requirements, permitting requirements, and the time required for the measure to achieve a given performance. The safety of nearby communities as well as the safety of site workers was also evaluated. Table 1 shows the technical performance evaluation for each of the proposed remedies.
- Environmental Concerns: An environmental assessment was performed for each remedial alternative. This assessment focused on both the short- and long-term beneficial and adverse effects on the facility conditions and pathways of contamination addressed by each alternative. Table 2 shows the environmental concerns evaluation for each of the proposed remedies.
- Human Health Concerns: Each alternative was evaluated to assess the short- and long-term impacts on human health. Alternatives were evaluated to determine how each protects human health during and after implementation of the corrective measure. Table 2 shows the human health concerns evaluation for each of the proposed remedies.
- Regulatory Compliance: The effects of relevant Federal, State, and local regulations were assessed for each of the alternatives. Table 2 shows the regulatory compliance evaluation for each of the proposed remedies.
- Cost: BNSF developed preliminary capital and operating costs for each alternative. Capital costs include equipment purchase and installation, instrumentation and controls, site work, engineering, and utilities. Operating parameters include labor, utilities, materials, facility maintenance, analytical, and disposal costs. Table 1 shows the cost evaluation for each of the proposed remedies.

Determinations Made from the Selection Criteria

Technical Performance

DEQ's preferred alternative would effectively destroy contaminant mass through biological land treatment. Bioremediation is a preferred technology (presumptive remedy) for contaminated soils at wood-treating sites such as Paradise. Land treatment of creosote-impacted soil has been successfully accomplished at Paradise since the fall of 1989. Upon completion of biological treatment of impacted soil and backfilling of the excavated areas, the risk of exposure to impacted soil would be permanently reduced and minimized.

Reliability

DEQ's preferred remedy involves land treatment. Treatment has reduced the initial concentration of 9,800-mg/kg total PAHs applied to the LTU in 1989 by 99.9 percent. Operation of the LTU would include analytical sampling, tilling, irrigation, and fertilization at the frequency required by BNSF's hazardous waste permit. Failure of the LTU could allow exposure to impacted soil in the unit or allow the spread of impacts beyond the unit. However, the impacted soil is currently spread over several SWMUs. Placement of the impacted soils from SWMUs on the LTU would consolidate the contaminated surface soils to a more controlled area on the site. The volume of soil requiring treatment could exceed estimated volumes during excavation operations.

Implementability

There are no technical obstacles to the land treatment remedy preferred by DEQ since the LTU is already constructed and has successfully treated Paradise soil in the past. Regular agricultural operations, such as tilling and irrigation, and monitoring would be required as specified in BNSF's hazardous waste permit. Highly specialized equipment and personnel would not be required to implement land treatment. BNSF estimates that it will take 4 weeks to excavate the volume of soil necessary to meet industrial action levels and 15 weeks to excavate the volume of soil needed to meet residential action levels.

Safety

The implementation of DEQ's preferred alternative could impact the safety of nearby communities and site workers since impacted soil would be exposed and handled during remediation actions. However, some contaminated soil is already exposed on the surface of the SWMUs. Normal construction-site safety precautions would be necessary during remediation to ensure the safety of site workers and nearby residents.

Although exposure could potentially occur during remediation activities in the SWMUs, the site health and safety plan has been in use since 1989 to minimize potential exposure. LTU management and operations requirements in BNSF's hazardous waste permit are designed to minimize fugitive dust emissions to the local community.

A much larger volume of contaminated soil (20,000 cubic yards) was excavated at the site in 1985. The soil remained in a waste pile for approximately four years until it was placed on the newly permitted LTU in 1989. Air monitoring was performed at the site during excavation of the surface impoundment wastes from the waste pile and application of wastes to the LTU. Monitoring continued beyond the loading process and into the treatment (tilling) period. The air quality assessment showed that during the "worst case" emission period when loading and operating the LTU, emissions from the LTU were below the federal health standards for ambient air quality for particulate matter. In DEQ's preferred soil remedy, a much smaller volume of less contaminated soil (approximately 6,220 cubic yards) would be excavated for treatment. Any stockpiling of the excavated soil before treatment would be for a short duration. The new hazardous waste permit includes requirements for air quality monitoring during excavation and remediation of soils and during the application of remediation soils to the LTU. The permit also requires BNSF to implement dust control measures on the LTU and on roads used for transporting the contaminated soil to the LTU. These requirements are to ensure that BNSF creates no emissions that impact human health and the environment.

Environmental Concerns

DEQ's preferred alternative would reduce the surface soil contaminant mass, which will reduce the long-term environmental exposure.

Human Health Concerns

Implementation of DEQ's preferred alternative would have minimal short-term impacts on human health associated with remediation activities since soil would be exposed and handled. Land treatment of impacted soil from the SWMUs would destroy contaminant mass and remove the potential for long-term exposure from the soil.

Excavation of soils where the contamination is greater than the industrial action level of 40 ppm cPAH will also address most of the areas where the soil contamination exceeded the residential action level. Most of the areas that exceeded the residential action level of 20 ppm cPAH will be excavated because soils in the area also exceeded the industrial action level.

Regulatory Compliance

No regulatory compliance issues have been identified relative to implementation of DEQ's preferred alternative.

Cost

Capitol costs for DEQ's preferred alternative total $483,530 for industrial action levels. Costs include excavation, land treatment, and backfill of impacted areas. Annual operating and maintenance costs are estimated at $47,740 to $64,740, depending on the year of operation. These totals include LTU operation, cover maintenance, institutional controls, and the prospective groundwater remedy, which will be proposed in a subsequent permit modification. Estimated present worth costs of $1,535,548 are based on a total project life (operation and monitoring) of 30 years.

PUBLIC PARTICIPATION

DEQ and EPA have informed the public of the corrective action activities at the Paradise Site through a variety of outreach activities, including fact sheets and public meetings. The Agencies also have periodically briefed a local citizens group, which is called the Paradise Creosote Monitoring Committee (PCMC), on the status of the corrective action. Through this public comment, the DEQ is seeking input from the community on the preferred remedy and the cleanup alternative described in this document. The public may also comment during a 45-day period on remedy alternatives not addressed in the CMS or this document. DEQ has set a public comment period from May 2, 2001 through June 15, 2001 to encourage public participation in the remedy selection process. The comment period includes a public meeting on May 23, 2001 at the Methodist Clubhouse in Paradise, Montana, at which DEQ will present the Statement of Basis, answer questions, and accept both oral and written comments.

DEQ will prepare a Response to Comments after reviewing oral and written comments. DEQ will then finalize this Statement of Basis and include both documents in the public record for the site. DEQ will announce the availability of the final Statement of Basis and Response to Comments to the local newspaper and to those on the site mailing list.

The selected remedy will be carried out under BNSF's hazardous waste permit once the permit is effective. Under the permit, BNSF will prepare a work plan called a Corrective Measures Implementation (CMI) Plan to address the details of the surface soil remedy. DEQ must approve the CMI Plan before BNSF can carry out the work.

REFERENCES

U.S. EPA, RCRA Facility Assessment for Burlington Northern Railroad Tie Treating Facility, April 1989.

U.S. EPA, Advance Notice of Proposed Rulemaking Federal Register (61 FR 19432), May 1, 1996.

U.S. EPA, Treatment Technology Performance and Cost Data for Remediation of Wood Preserving Sites, October 1997.

Retec, RCRA Facility Investigation Work Plan for the BN Paradise Tie Treating Facility, September 1991.

Retec, Baseline Risk Assessment, October 1993.

Retec, Final Phase I Report, RCRA Facility Investigation, BN Tie Treating Plant, Paradise, Montana, August 1994.

Retec, Final Phase II Report, RCRA Facility Investigation, BN Tie Treating Plant, Paradise, Montana, July 1996.

Retec, Corrective Measure Study Workplan, Paradise Tie Treating Plant, Paradise, Montana, June 1997.

ThermoRetec, RCRA Corrective Measures Study for Solid Waste Management Units, BNSF Paradise Tie Treating Plant, Paradise, Montana, July 12, 1999.

ThermoRetec, Letter to EPA Transmitting Updated Cost Table, August 20, 2000.

*TABLE 1. TECHNICAL PERFORMANCE EVALUATION OF ALTERNATIVE SURFACE SOIL REMEDIES**

Alternative	Alternative Description	Performance	Reliability	Implementability	Short-Term Safety	Cost (total present worth)
1 No Further Action	Continue existing institutional controls	Poor Exposure potential for impacted soils	Poor	Very good No action required.	No issues for implementation	$601,000
2 Clean Cover	Cover SWMUs; Backfill SWMU 10; Add institutional controls.	Good Soil exposure controlled	Good, but requires long-term maintenance	Very good, simple construction method. 4 weeks to excavate to industrial levels 7 weeks to excavate to residential levels	Very good, no soils handling	Industrial action level: $919,000; residential: $986,000
3 Thermal Desorption	Excavation and on-site thermal desorption; Backfill SWMU 10; Add institutional controls.	Very good Soil exposure source removed	Good, but complicated method and equipment	Good, requires thermal desorption contractor and permitting. 5 weeks to excavate to industrial levels 20 weeks to excavate to residential levels	Low, soils must be handled and emissions from treatment managed. High temperatures and complex equipment pose unique hazards.	Industrial action level: $3,026,000; residential: $11,602,000
4	Excavation and on-	Good	Good, proven	Good, already	Good, soils must	Industrial action

Land Treatment	site land treatment; Backfill SWMU 10; Add institutional controls.	Soil exposure source moved to LTU and treated	method, simple	implemented on site 4 weeks to excavate to industrial levels 15 weeks to excavate to residential levels	be handled, screening and farm equipment safety issues	level: $1,535,548; residential: $3,772,000
5 Off-site Disposal	Excavation and off-site disposal; Backfill SWMU 10; Add institutional controls.	Very good Soil exposure source removed to off-site facility	Good, simple method, limitations on permitted disposal facility	Off-site land disposal not feasible without exemption 4 weeks to excavate to industrial levels 15 weeks to excavate to residential levels	Good, soils handling and transport; does not include farming or screening equipment	Industrial action level: $4,370,000; residential: $17,483,000

TABLE 1, CONTINUED

6 Combination	Excavation and on-site land treatment SWMUs 7, 15, & 17; Cover SWMUs 12, 13, 18; Backfill SWMU 10; Add institutional controls.	Good Soil exposure source moved to LTU and treated or controlled	Good, proven simple methods; covers require maintenance	Good, already implemented on site, simple construction method 4 weeks to excavate to industrial levels 6 weeks to excavate to residential levels	Good, soils must be handled, screening and farm equipment safety issues	Industrial action level: $1,158,000; residential: $1,825,000
7 Combination	Excavation and on-site land treatment	Good Soil exposure	Good, proven simple methods;	Good, already implemented on site,	Good, soils must be handled,	Industrial action level:

	SWMUs 7 & 17; Cover SWMUs 12, 13, 15, & 18; Backfill SWMU 10; Add institutional controls.	source moved to LTU and treated or controlled	covers require maintenance	simple construction method 4 weeks to excavate to industrial levels 6 weeks to excavate to residential levels	screening and farm equipment safety issues	$990,000; residential: $1,375,000
8 Phyto-remediation	Cover (6") SWMUs 12, 13, & 18; Phyto-remediation for SWMUs 7, 12, 13, 15, 17, & 18.	Poor More exposure potential for impacted soils until degradation complete. Possible slow rate of degradation.	Low, failure possible due to range of environmental factors	Good, simple construction method, irrigation likely required Unknown time period to excavate to soil action levels	Very good, no soil handling	Residential action levels $932,000

** Tables 1 & 2 are modified tables from the 1998 CMS*

TABLE 2. EXPOSURE CONCERNS EVALUATION OF ALTERNATIVE SURFACE SOIL REMEDIES*

Alternative	Alternative Description	Environmental Concerns	Human Health Concerns	Regulatory Compliance
1 No Further Action	Continue existing institutional controls	Allows exposure to impacted soils	No additional short-term exposure. Continued long-term exposure source.	Does not meet regulatory requirements.
2 Clean Cover	Cover SWMUs; Backfill SWMU 10; Add institutional controls.	Controls soil contact exposure pathway	No additional short-term exposure. Long-term exposure source covered.	Meets regulatory requirements. Requires institutional controls.
3 Thermal Desorption	Excavation and on-site thermal desorption; Backfill SWMU 10; Add institutional controls.	Removes soil exposure source	Potential short-term exposure from excavation and screening. No long term exposure source.	Meets regulatory requirements. Requires institutional controls and air permit.
4 Land Treatment	Excavation and on-site land treatment; Backfill SWMU 10; Add institutional controls.	Reduces soil exposure source	Potential short-term exposure from excavation and screening. No long term exposure source.	Meets regulatory requirements. Requires institutional controls.
5 Off-site Disposal	Excavation and off-site disposal; Backfill SWMU 10; Add institutional controls.	Removes soil exposure source	Potential short-term exposure from excavation and screening. No long term exposure source.	Meets regulatory requirements. Requires institutional controls and air permit and exemption for disposal facility.
6 Combination	Excavation and on-site land treatment SWMUs 7, 15, & 17; Cover SWMUs 12, 13, 18; Backfill	Reduces soil exposure source in SWMUs 7,15, & 17. Controls soil contact exposure pathway in	Potential short-term exposure from excavation and screening. No long term exposure source if maintained.	Meets regulatory requirements. Requires institutional controls.

	SWMU 10; Add institutional controls.	SWMUs 12, 13, & 18.		
7 Combination	Excavation and on-site land treatment SWMUs 7 & 17; Cover SWMUs 12, 13, 15, & 18; Backfill SWMU 10; Add institutional controls.	Reduces soil exposure source in SWMUs 7 & 17. Controls soil contact exposure pathway in SWMUs 12, 13, 15 & 18.	Potential short-term exposure from excavation and screening. No long term exposure source if maintained.	Meets regulatory requirements. Requires institutional controls.
8 Phyto-remediation	Cover (6") SWMUs 12, 13, & 18; Phyto-remediation for SWMUs 7, 12, 13, 15, 17, & 18.	Limits exposure to impacted soil; unknown period of time required.	Potential short-term exposure during planting. Possible continued long-term exposure source.	Unknown whether regulatory requirements will be met. Requires institutional controls.